

GROWING METHOD FOR ATOMIC LAYER LEVEL ZINCBLENDE-TYPE CRYSTAL AND ITS DEVICE

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Inventor(s): SHINOHARA KOJI; others: 02
Applicant(s): FUJITSU LTD
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Abstract.

PURPOSE: To control an epitaxial growth in an extremely thin unit to improve an integrity of a semiconductor, by putting respective atomic materials, which compose zincblende-type crystal, in a plurality of evaporative jars and opening/closing shutters, by which these evaporative jars are alternately opened/closed, so that atomic layers are made to alternately grow on a substrate.

CONSTITUTION: Atomic materials 12 and 13 composing A and B crystals are put in respectively evaporative jars 7 and 8. For example, Zn is put in the evaporative jar 7 and S being in the evaporative jar 8. After the whole device is made to be in a vacuum state, the evaporative jars 7 and 8 are heated by outside heaters 14 and 15. A 111-plane substrate 3 on a supporting board 4 is heated at about 300 deg.C by a heater 5 in a state in which its A plane 1 (Zn plane) is exposed. With a shutter 10 being opened, the substrate is exposed to a vapor atmosphere of B atom S. The A plane is easy to attach the B atom to. Besides, after one layer of the B atom is attached so that a B plane 2 is formed, more B atoms are repelled. After formation of the B plane, the shutter 10 is closed and a shutter 9 is opened to expose the substrate to the vapor atmosphere of A atom (Zn). Alternate repetition of the said operation enables zincblende-type crystal to epitaxially grow on an atomic layer level on the substrate.